

Sustaining Distributed Operations - Throughput Requirements and Solutions

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to

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As we select our forces and plans our operations,...[w]e must understand how logistics can impact on our concepts of operation...Commanders must base all their concepts of operations on what they know they can do logistically.

-A.M. Gray, Jr.

In the winter of 1939, the Soviet Union invaded Finland expecting a quick and easy victory as they were highly numerically superior. Realizing that the Soviets had far greater numbers of personnel and equipment, the Finns employed a simple form of distributed operations. They utilized company and battalion-size units spread across the battlefield and successfully attacked the Soviet Union's less mobile columns and inflicted disproportionate casualties upon a larger force.¹ Although initially successful, the Finns lacked the throughput of supplies and logistical capabilities to maintain their effort. Even though the Soviets suffered tremendous losses in personnel and equipment, they were able to re-establish their assets. On the other hand, the Finns were unable to replace their losses and were eventually attrited by the sheer numbers of the Soviet Union. Because the Finns were not able to sustain their campaign, they were unable to continue combat operations.

Similarly, as the Marines Corps faces adversaries that are ever-changing and creative, the Marine Corps staying true to our maneuver warfare philosophy has adopted, distributed operations (DO) as a conceptual answer to the emerging threat. The DO concept employs "small, highly capable units spread across a large area of operations that will provide the spatial advantage commonly sought in maneuver warfare, in that they will be able to sense an expanded battle space, and can use close combat or supporting arms, including joint fires, to disrupt the enemy's access to key terrain and avenue of approach."² As with the Finns however, DO presents logistical problems. For DO to be

¹ Gen Michael W. Hagee, "A Concept for Distributed Operations: Annex A," 45

² Ibid., 44

successful the Marine Corps must take significant steps to sustain combat forces, specifically in the throughput of supplies and casualty evacuation.

DO Defined

When the DO concept is mentioned, perceptions often vary: a way to fund and procure high tech equipment (modernize Marine equipment); revolutionary training with cutting edge education; the ability to employ joint fires by the small unit leaders; and a reliable, over-the-horizon command and control network supported by satellite communications. Still others hail DO as additional capability for maneuver warfare that combines training with modern technology. As defined by the Commandant of the Marine Corps,

Distributed Operations describes an operating approach that will create an advantage over an adversary through the deliberate use of separation and coordinated, interdependent, tactical actions enabled by the increased access to the functional support, as well as by enhanced combat capabilities at the small-unit level. The essence of this concept lies in the capacity for coordinated action by dispersed units, throughout the breadth and depth of the battlespace, ordered and connected within an operational design focused on a common aim....*Distributed Operations* describes an operating approach that requires new ways to educate and train our Marines and that guides us in the use of emerging technologies.³

DO is a continuation of the Marine Corps historical movement promoting small unit leadership at the tactical level by advancing dispersion and allowing for optimal independence.

³ Gen Michael W. Hagee, "A Concept for Distributed Operations: Annex A," 43-44

Sustainment

Strategic and Operational logistic support into theater is the responsibility of the United States Transportation Command and Military Sealift Command. The United States Army is responsible for theater distribution and logistical support via the Theater Support Commands (TSC). Major subordinate command service support, which is composed of the logistics combat element (LCE), facilitates and distributes the final leg of the logistics delivery system to the individual unit. It is this final leg (the last tactical mile) of the logistics train that is the most difficult.⁴

Throughput

Within a linear battlefield, the logistics flow is one that follows Marine Corps doctrine: moving supplies along a secure main supply route (MSR) or lines of communication (LOC) to a central area from which point the supplies are moved to smaller points. The challenge in a dispersed / asymmetrical DO environment is that the number of supply points increases exponentially as does the frequency with which the units need to be re-supplied. Given the current number of organic assets, ground units cannot conduct internal re-supply to forces dispersed because an infantry battalion can easily exceed the capabilities of their organic ground transportation. The burden of delivering sustainment to dispersed units then would be placed on the LCE and the aviation combat element (ACE). For example, if an infantry battalion dispersed three rifle companies at the squad level, the supporting element might need to transport

⁴ LtCol Darrell L. Thacker, *The Joint Interdependence of Distributed Operations* (US Army War College, PA), 7

supplies to over 30 supply points versus three. Of course, the supply points can increase or decrease depending on many factors; however, multiple locations correlates to multiple supply points. Thus, the number of supply points will further increase with multiple operating battalions, and even more if there is dispersion at the fire team level.

The throughput of sustainment is a necessity in order to continue operations. Transporting sustainment on the ground or in the air will be challenging with the current amount and type of equipment. For instance, ground movement will most likely face unsecured MSRs, adding the need for additional security, which will potentially pull combat power from the ground combat element (GCE). Further, ground transportation will take longer than air because of the increased number of supply points. Some may argue that the combat service support element can internally re-supply at the platoon level. The assumption is that this would reduce the number of supply points, thus saving time. However, research conducted by Marine Corps Warfighting Laboratory (MCWL) proved internal resupply was not a viable option. When Helicopter re-supply was employed at a single location to a single platoon, the platoon took ten hours to distribute the supplies among its three squads.⁵

Evacuation

Undoubtedly, the ACE will play a large role within the DO concept due to the potentially unsecured MSRs in the asymmetrical battlefield. However, the Marine Corps runs the risk of overtaxing its ACE: already tasked with combat assault support, the ACE will be forced to execute more sorties to sustain troops. Subsequently, this will increase the need for more flight hours and increase aircraft maintenance requirements. Not only

⁵ Vince Goulding, *Final Report on Phase I of Distributed Operations Experimentation* (Marine Corps Warfighting Laboratory: 2005-2006), 20

does the ACE provide combat assault support, but it also provides the primary means of casualty evacuation. Because ground transportation will prove to be untimely to the units who are farthest away, air must be the means to keeping within the “golden hour”. Timely casualty evacuation is the critical missing requirement, which is needed for DO to reach its full potential.

Implementing Change and Counterarguments

Distributed operations will change the way ground units operate and, thus, complementary changes need to be made to the logistical system that supports them. Units operating in a widely dispersed fashion will require unique combat logistics support, given that ground lines of communication will rarely be secure in the traditional sense.⁶ Modifications must be implemented to reduce the frequency and volume of sustainment that units require by reducing the consumption of supplies, such as batteries, or, instead, providing the units the ability to regenerate supplies, such as water and power, themselves. Another consideration is how to distribute logistics effectively to small units when they do need re-supply without tying up mobility assets for other support functions.⁷ “The delivery to the unit in the field over the “last tactical mile” is even more challenging when the unit is actually involved in combat operations. The tried-and-true methods of vehicle and aviation supply will be applicable at times when a unit is conducting more conventional operations.”⁸

Because of the enemy threat, and the desire to remain unobtrusive, other platforms for sustainment and/or casualty collection must be explored. An alternative

⁶ Gen Michael W. Hagee, “A Concept for Distributed Operations: Annex A,” 48

⁷ LtCol Edward Tovar, USMC, “USMC Distributed Operations,” *DARPA Tech 2005* (August 2005), 24

⁸ LtCol Darrell L. Thacker, *The Joint Interdependence of Distributed Operations* (US Army War College, PA), 8

method of responding to these issues is the use of joint precision aerial delivery (JPAD), the unmanned ariel vehicles (UAV) and unmanned ground vehicles (UGV). The JPAD system involves the use of a GPS parachute delivery system. “JPADS keeps aircraft crews out of harm’s way and involves more accurate high-altitude drops, allowing multiple targets in one sortie.”⁹ This would notably reduce sorties from the ACE but also conserve combat power by eliminating the need for the LCE to re-supply DO units by ground on non-secure LOCs. A major drawback with the JPADS system is the initial cost associated with each delivery and the training needed to utilize the technology, the cost, however, will be viewed as more acceptable when compared against the utilization capabilities and life span of other alternatives. Of course, comparison in terms the loss of lives is incalculable. Finally, the cost will be reduced over time with future improvements.

UAVs and UGVs can also be implemented to save lives and equipment. If a UAV can deliver a payload of precision guided munitions, then it is conceptually feasible that it could also deliver needed supplies such as MREs, water, ammunition, medical supplies, etc. Similarly, a UAV or UGV could be used for casualty evacuation in a hostile environment. If a situation existed in which the threat was too high to bring in an aircraft or vehicle, a UAV or UGV could be used for urgent medical evacuation.

Current technology does not exist, however, to the extent needed to execute DO properly. With further research and development this can be a possible capability.

⁹ Sgt. Jon Cupp, “JPADS to change the future of joint aerial deliveries for warfighters” (Virginia: 2005), 2

Conclusion

“Logistics is what will allow the distributed operations concept to fully mature into a combat multiplier.”¹⁰ History has shown that the lack of logistical planning and sustainment can impede combat operations and turn the initiative and advantage to the enemy, thus, a balance must be struck between operators and logisticians so that the DO concept is feasible and sustainable. Several options exist but need further exploration before fully implementing DO. Without feasible throughput of sustainment and casualty evacuation, the DO concept is only theory. Achieving the necessary level of logistical capability within the DO concept demands equally important and innovative means for sustainment and casualty evacuation. The success of DO lies in the throughput of sustainment that does not overextend existing logistical capabilities.

Word Count: 1631

¹⁰ LtCol Darrell L. Thacker, *The Joint Interdependence of Distributed Operations* (US Army War College, PA), 6

Bibliography

- Cupp, Sgt. Jon. "JPADS to change the future of joint aerial delivers for warfighters." <http://www.jfcom.mil/>. Norfolk, Virginia. 6 June, 2005.
- Hagee, Gen. Michael W. "Annex A – A Concept for Distributed Operations." *Distributed Ops LOE-1 AAR*. 25 April 2005.
- Kramlich, Lt. Gen. Richard S. "Logistics Operations in Complex and Distributed Environments." 1 June 2007.
- Goulding, Vince. *Final Report on Phase I of Distributed Operations Experimentation*. Marine Corps Warfighting Lab, 2005-2006.
- Marine Corps Warfighting Lab, *Distributed Operations 2006 Capabilities and Enhancements Report as of 19 Jan 05*, 1.
- Thacker, Jr, Lt. Col. Darrell L. "The Joint Interdependence of Distributed Operations." Carlisle Barracks, PA: U.S. Army War College, 21 January 2005.
- Tovar, Lt. Col. Edward. "USMC Distributed Operations." *DARPA Tech 2005* pp 22-24, August 9-11, 2005.